

Ultracold molecules - Nature as a broken mirror

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The Standard Model of Particle Physics predicts that the effect of weak interactions in the nuclei of molecules results in parity violating observables. Parity violation has already been seen in atomic systems but not in molecules. We are currently building a setup that can detect parity violation in heavy diatomic molecules. Using a traveling-wave Stark decelerator we will decelerate and trap a supersonically expanded molecular beam of SrF. Combined with molecular laser cooling this results in an ultracold cloud of SrF that can be used for high-precision spectroscopy measurements to reveal the parity violation signal. In the talk we will focus on the motivation for using SrF and discuss the current status of the experiment.

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